

# More Complex Fraction Problems...

Name

Key

$$1. \frac{1 + \frac{3}{5}}{3 + \frac{1}{7}} = \frac{\frac{5}{5} + \frac{3}{5}}{\frac{21}{7} + \frac{1}{7}} =$$

$$\frac{\frac{8}{5}}{\frac{22}{7}} = \frac{8}{5} \cdot \frac{7}{22} = \frac{28}{55}$$

$$2. \frac{\frac{4}{x} + \frac{1}{2x}}{\frac{1}{3x} + \frac{3}{4x}} = \frac{\frac{8}{2x} + \frac{1}{2x}}{\frac{4}{12x} + \frac{9}{12x}} = \frac{\frac{9}{2x}}{\frac{13}{12x}} = \frac{9}{2x} \cdot \frac{12x}{13} = \frac{54}{13}$$

$$\frac{9}{2x} \cdot \frac{12x}{13} = \frac{54}{13}$$

$$3. \frac{\frac{\sqrt{3}}{3} - 1}{1 + \frac{\sqrt{3}}{3}} = \frac{\frac{\sqrt{3}}{3} - \frac{3}{3}}{\frac{3}{3} + \frac{\sqrt{3}}{3}} = \frac{\frac{\sqrt{3}-3}{3}}{\frac{3+\sqrt{3}}{3}} =$$

$$\frac{\sqrt{3}-3}{3} \cdot \frac{3}{3+\sqrt{3}} = \frac{\sqrt{3}-3}{3+\sqrt{3}} \cdot \frac{3-\sqrt{3}}{3-\sqrt{3}} =$$

$$\frac{3\sqrt{3}-3-9+3\sqrt{3}}{9-3\sqrt{3}+3\sqrt{3}-3} = \frac{6\sqrt{3}-12}{6} =$$

$$\sqrt{3}-2$$

$$4. \frac{1 + \frac{\sqrt{3}}{3}}{1 - \frac{\sqrt{3}}{3}} = \frac{\frac{3}{3} + \frac{\sqrt{3}}{3}}{\frac{3}{3} - \frac{\sqrt{3}}{3}} = \frac{\frac{3+\sqrt{3}}{3}}{\frac{3-\sqrt{3}}{3}} =$$

$$\frac{3+\sqrt{3}}{3} \cdot \frac{3}{3-\sqrt{3}} = \frac{3+\sqrt{3}}{3-\sqrt{3}} \cdot \frac{3+\sqrt{3}}{3+\sqrt{3}} =$$

$$\frac{9+3\sqrt{3}+3\sqrt{3}+3}{9+3\sqrt{3}-3\sqrt{3}-3} = \frac{12+6\sqrt{3}}{6} = 2+\sqrt{3}$$

$$5. \frac{\tan 60^\circ + \tan 45^\circ}{1 - \tan 60^\circ \tan 45^\circ}$$

$$\frac{\sqrt{3} + 1}{1 - \sqrt{3} \cdot 1} = \frac{\sqrt{3} + 1}{1 - \sqrt{3}} \cdot \frac{1 + \sqrt{3}}{1 + \sqrt{3}} =$$

$$\frac{\sqrt{3} + 3 + 1 + \sqrt{3}}{1 + \sqrt{3} - \sqrt{3} - 3} = \frac{2\sqrt{3} + 4}{-2} = -\sqrt{3} - 2$$

$$6. \frac{\tan \frac{4\pi}{3} - \tan \frac{\pi}{4}}{1 + \tan \frac{4\pi}{3} \tan \frac{\pi}{4}} = \frac{+\sqrt{3} - 1}{1 + (-\sqrt{3})(-1)} = \frac{+\sqrt{3} - 1}{1 + \sqrt{3}} \cdot \frac{1 - \sqrt{3}}{1 - \sqrt{3}} =$$

$$\frac{+\sqrt{3} - 3 - 1 + \sqrt{3}}{1 - \sqrt{3} + \sqrt{3} - 3} = \frac{2\sqrt{3} - 4}{-2} = -\sqrt{3} + 2$$